DefenceNews

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What is DRDO's inertial guided bomb and how it will boost India's defence capability

India Friday successfully test fired an indigenously-made 500-kg class "inertial guided bomb" from a Sukhoi jet at the Pokhran test range in Rajasthan. The test has been pegged as a major achievement for the Defence Research and Development Organisation (DRDO) as the guided bomb achieved the desired range and also hit its target with precision.

"All the mission objectives have been met. The weapon system is capable of carrying different warheads," a statement from the Ministry of Defence said.

Sources in the defence establishment said that the inertial guided bomb marks an upgrade from the existing laser-guided weapon delivery capability, which has certain limitations, such as range of delivery from the target and susceptibility to environmental conditions.

"It is also a testament to DRDO's capability to develop miniaturised inertial navigation systems that can function under tough conditions," a source told The Print.

The Print explains the upgrade in weapon technology and its implications for the country's defence capability.

What is this bomb?

This 500-kg class precision bomb is guided to its target through the inertial guidance system, which allows precision targeting from long distances even under adverse visibility conditions.

According to Britannica, the inertial guidance system is an electronic system that continuously monitors the position, velocity and acceleration of a vehicle, usually a submarine, missile, or aeroplane, and provides navigational data or control without the need for communicating with a base station.

When an inertial navigation system is installed in a bomb, the system can help navigate the bomb to its designated target by continuously providing updated navigation inputs. Such systems have the unique ability to perform without depending on external inputs such as ground-based navigation aids as well as GPS, defence experts told ThePrint.

A recent example of such a bomb is the Israeli SPICE-2000 smart bombs that were used by the Indian Air Force in the Balakot attack in Pakistan. They had a glide range of around 60 km and used a sophisticated guided system — including inertial navigation, satellite guidance and electro-optical sensors, for accuracy.

Countries such as the United States and Israel have been using such guided bombs for some years, but it is a first for India, with the system being indigenously developed by the DRDO.

A senior IAF official explained that navigation has mainly two aspects. "Where you are at the moment and what is your destination are the two aspects of navigation," the official said. "The weapon's current location is dictated by the aircraft's inertial navigation system. The destination is guided by feeding it with target coordinates and the desired weapon path is achieved by other control inputs," the official added.

"Such a bomb does not have an engine of its own but runs on the inertia imparted to it by the mother aircraft."

A retired IAF official, who did not wish to be identified, said: "Such a weapon can be fired even without a Global Navigation Satellite System (GNSS) input, denial of which is a high possibility in emerging forms of warfare."

Indian fighter jets had inertial navigation systems earlier too, but the weapons were based on optical or laser guidance. However, this bomb uses a miniaturised Inertial Navigation Systems — indigenously developed by DRDO — as an integral component.

How does it boost country's defence capability?

Defence sources said the new capability, when operationally deployed, would allow an IAF aircraft to deliver weapons from longer ranges, thus allowing them to stay away from enemy air defence cover. "This would ensure higher battlefield survivability of the aircraft and ensure the safety of the pilots and the delivery platforms," the sources said.

It would also ensure high mission reliability and low collateral damage, which could be an effective strategic deterrence for an adversary, the sources added. This inertial guidance technology will also be useful for the development of other long-range precision-guided weapons.

While the DRDO is developing these high accuracy weapon delivery systems, capable of working on GNSS degraded and denied environments, getting accurate target coordinates is still a challenge.

A strong focus would also be required to ensure that accurate target coordinates are available to the user to ensure high mission reliability.

http://www.defencenews.in/article/What-is-DRDO%E2%80%99s-inertial-guided-bomb-and-how-it-will-boost-India%E2%80%99s-defence-capability-584929

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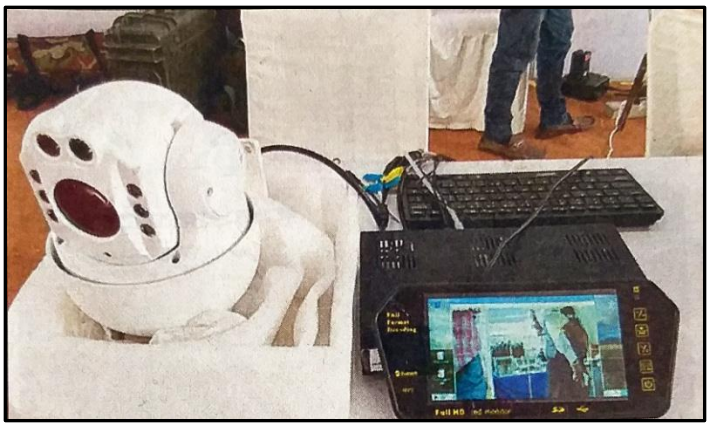
DRDO's surveillance system to bolster Army's defence system along the border

By Yogesh Kumar

Dehradun: To bolster the Indian Army's defence and surveillance systems along the border, the Dehradun-based Instruments Research and Development Establishment (IRDE), an arm of the Defence Research & Development Organisation (DRDO), has developed a state-of-the-art surveillance equipment —Video and Image Processing Enhancement and Recognition System (VIPERS).

According to scientists at IRDE, VIPERS is an automated round-the-clock multi-sensor surveillance system capable of providing high-resolution imaging in any environment. It will also enable the army to get "clinical precision while firing".



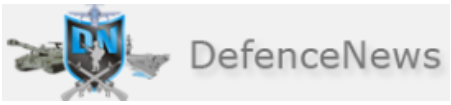
"VIPERS is based on artificial intelligence and can recognise 20 different types of objects at a distance of up to 20 kilometre range. It is equipped with a convolutional neural network hardware chip which can capture photos at seven frames per second. Several chips can be teamed up to boost the performance of the automated surveillance in real time," said JP Singh, a senior scientist at IRDE who is heading the project team.

"VIPERS can work with day and night cameras, including Thermal Imagers, Active Laser, IR LED etc., to ensure flawless surveillance," added Singh.

The scientist further said that it took a few decades to shape up the system.

"The system has been developed after painstaking efforts of several years. My team is excited about the forthcoming field trials to be conducted by Indian Army next month which would test the entire range of features of the system and also help plan the next level of upgrade," said Singh.

https://timesofindia.indiatimes.com/city/dehradun/drdos-surveillance-system-to-bolster-armys-defence-system-along-the-border/articleshow/69548971.cms



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IAF to arm Russian-made Su-30MKI fighters with BrahMos-A missiles

About 40 Russian-made Su-30MKI fighter jets of India's Air Force will be armed with BrahMos-A air-launched missiles in the next two or three years, CEO and Chief Designer of Russia's Research and Production Association of Machine-Building Alexander Leonov said on Tuesday.

"As for the plans, the serial production has been launched and rearmament will be carried out, as our Indian colleagues have promised on many occasions. About 40 planes as the first batch will be equipped with BrahMos missiles. Of course, this will require some time, no less than two or three years, to re-equip the planes and produce air-launched BrahMos missiles," the chief executive said.

Manager for Marketing at the Russia-India BrahMos Aerospace Joint Venture Praveen Pathak told TASS last week that the BrahMos-A air-launched missile, which the JV was developing, had hit a ground target for the first time during a test launch. In 2017, the BrahMos-A missile was test-launched for the first time, successfully hitting a naval target.

The chief executive of the Research and Production Association of Machine-Building said that the two test launches were "very important" as they had been held both against a naval and a ground target. "The universal nature of the BrahMos missile has been fully confirmed," Leonov said.

The BrahMos missile has been developed by Russia's Research and Production Association of Machine-Building (the town of Reutov near Moscow) and India's Defense Research and Development Organization (DRDO).

The missile's name comes from the names of two rivers: the Brahmaputra of India and the Moskva of Russia. The missile's first launch took place on June 12, 2001 from a coastal launcher. The missile's production has been arranged at enterprises in Russia and India.

http://www.defencenews.in/article/IAF-to-arm-Russian-made-Su-30MKI-fighters-with-BrahMos-A-missiles-584938